

We claim:

1. A dedicated bandwidth data communication switch backplane, comprising:

a plurality of switching controllers; and

5 a plurality of packet buses, each packet bus having a root interfacing with a different one of the switching controllers and a plurality of leaves interfacing with a plurality of the switching controllers, wherein a plurality of the switching controllers propagate packet data in parallel from the roots with which the switching controllers interface to the leaves.

10 2. The backplane according to claim 1, further comprising:

a plurality of claim lines, each claim line interfacing with a plurality of the switching controllers and having an association with a different one of the packet buses, wherein a switching controller transmits a claim signal on a packet bus's associated claim line upon identifying a packet propagated on the packet bus for capturing.

15 3. The backplane according to claim 1, further comprising:

a plurality of stall lines, each stall line having a root interfacing with a different one of the switching controllers, a plurality of leaves interfacing with a plurality of the switching controllers and an association with a different one of the packet buses, wherein a switching controller transmits a stall signal from a leaf to the root on a packet bus's associated stall line upon identifying a congestion condition for the packet bus.

20 4. A switching controller for a dedicated bandwidth data communication switch backplane having a plurality of packet buses, each packet bus having a root and a

plurality of leaves, and a plurality of switching controllers for transmitting data on the packet buses, comprising:

a protocol domain interface adapted to receive packet data off a protocol domain;

a transmit interface adapted to transmit packet data received off a protocol domain

5 on the root of a packet bus; and

a receive interface adapted to receive packet data transmitted in parallel on the roots of a plurality of packet buses off leaves of a plurality of packet buses.

5. The switching controller according to claim 4, further comprising:

a plurality of claim line interfaces adapted to exchange claiming information for
10 the received packet data with other switching controllers.

6. The switching controller according to claim 4, further comprising:

a plurality of stall line interfaces adapted to transmit congestion information for the plurality of packet buses to other switching controllers.

7. In a data communication switch backplane having multiple transmit
15 interfaces and multiple receive interfaces interconnected across multiple packet buses, a method for selectively filtering packets propagated in parallel from a plurality of transmit interfaces to a plurality of receive interfaces on a plurality of packet buses, comprising:

for each packet, on each receive interface, determining if the packet's destination address is a recognized forwarding address;

20 for each packet, on each receive interface on which the packet's destination address is recognized, transmitting a claim signal to other receive interfaces on a claim line reserved for the packet bus on which the packet was received;

for each packet, on each receive interface on which the packet's destination address is not recognized, determining whether a claim signal has been received from another receive interface;

on each receive interface, capturing the packets for which a destination address is recognized on the receive interface or for which a claim signal has been received from another receive interface; and

on each receive interface, filtering the packets for which a destination address is not recognized on the receive interface and for which a claim signal has not been received from another receive interface.

8. In a data communication switch backplane having multiple transmit interfaces and multiple receive interfaces interconnected across multiple packet buses, wherein packets are propagated in parallel from a plurality of transmit interfaces to a plurality of receive interfaces on a plurality of packet buses, a method for preventing congestion from excessive rate transmission on particular ones of the packet buses, comprising:

on each transmit interface, propagating packets to a plurality of receive interfaces;

on each receive interface, capturing the packets for which forwarding is indicated;

for each packet, on each receive interface on which the packet is captured, determining whether there is sufficient room to queue the packet in a forwarding queue;

for each packet, on each receive interface on which there is not sufficient room to queue the packet in the forwarding queue, transmitting a stall signal to a transmit interface on a stall line reserved for the packet bus on which the packet was received; and

